

For these systems, the microprocessor CPU should be at 32 or 64 bit processors, capable of clock speeds in the 100 MHz or more. The microcomputer system may also consist of one or more I/O port means **62**. A PC Card interface **27** may be embodied for bus expansion, extended memory or other added circuitry having access to the main bus **60**. A mass memory device **42** may be embodied in the system, which typically is a magnetic disk memory hard drive. Many devices may be connected to the computer system, including a smart card interface **46** and keyboard **16**. A touch panel and pen input means **7** may be embodied in the system, which may be separate or integrated. Examples of such touch pen devices are available from Elo Touch Systems Inc. in Oak Ridge, Tenn., MicroTouch Systems Inc. in Methuen, Mass., and Carroll Touch Corp. in Round Rock, Tex. Pen and touch panel combinations means are available from Scriptel Corp. in Columbus, Ohio for the tablet, and Symbiosis Logic in Colorado Springs for an IC controller. Other pen and touch devices are available from Phillips Semiconductor, Sunnyvale Calif. Other more traditional cursor control devices **56** may be embodied, such as a mouse, trackball, touch pad, or force transducer. Preferably, most of these components should be sufficiently small as to fit into relatively thin display assembly **2**.

[0056] The flat display panel device **2** is be interfaced to the system bus **60** through display controller circuitry **44**. Preferably, the display controller should be capable of VGA or SVGA display formats. Integrated into the display controller may be a BitBlt engine (to accelerate graphics), RAMDAC memory, clock synthesizer and display frame buffer. A digital signal processing (DSP) co-processor **48** may be embodied. The DSP may accept data from many sources including a microphone **36** and video data source **43**. The DSP or microprocessor may output signals to one or more audio speakers, as shown as **10A** and **10B**. Video data may be in either analog or digital form. Microphone **36**, and speaker(s) may be embodied in the handset or earset of the previous figures. Video data may be pre-processed by a the DSP. Video sources may include output from video cameras, VCR, broadcast TV, satellite TV or cable TV.

[0057] External communication means **54** may be connected to the bus, which may be capable of fast two way data transfers. The communications means **54** should be capable of controlling communications to and from a plurality of wire and wireless communication systems. These include wire based telephone means **53** and wireless communication means **51**. The system may include an antenna means **32** for transmitting and receiving electromagnetic radiated signals. External communication means may be connected to one or more information or communication service providers. These service providers may include telephone services (RBOCs, LEC), on-line computer networks, Internet service providers, cable MSOs and/or long distance telephone firms. They also may include cable TV companies, satellite TV service, and LAN/WAN communication network providers. The external I/O port means **62** may be connected to a Universal Series Bus (USB) and/or an IEEE 1394 (Firewire®) type I/O bus.

[0058] FIG. 8 presents a typical flow diagram of computer programs executing in the system of the embodiments disclosed herein. After a power-on action **60**, the system may enter a standby power on mode **62**. A power management program **66** may then be execute followed by a self diag-

nostic routine **68** that tests the major hardware and firmware elements of the system. If the test fails, a failure report **66** may be generated and either displayed or stored. If the test passes, the operating system (OS) **70** may be loaded and executed. With the OS loaded successfully, the system waits for incoming data and/or voice calls **72**. The system may automatically enter a default system mode, or the user can select one or mode computer or communication modes **76**. The user has the option of selecting several operating modes, which may include a conventional computing mode **78**, a wireless data communications mode **80**, and a wireless voice communications mode **82**. A conventional computing mode includes typical PC computing or PDA computing. While in any of the above modes, base unit to external communications operations **79** may be controlled, which includes data/voice wire and wireless options. Control code **81** may control the bidirectional handset or earset to base unit communications operations. These operations may execute roughly simultaneously or on a time shared bases, as indicated by connection **83**. Under program control, either the wireless handset or the earset may communicate data first between the base unit, then the base unit may relay the data to/from the external communications network. The above communications may involve two way or bidirectional communications, including many types of data (including text, voice, graphics, video and/or images).

[0059] Many types of computer application programs may be executed by the computer system. For example, one or more telephony programs **84**, office/personal productivity programs **86**, electronic mail or voice mail **88**, and Internet/Web browsing programs **90** may be used. Other PDA, PC or workstation programs may also be executed. One or more programs (algorithms or routines) **96** may be used to control this multiple program or system modes; this may include program coordination, scheduling and execution. Programs to control the mobile communications relay functions **98** may be embodied. Users may have the option to exit the application programs **100**. Typically, after the applications have been closed, the user may exit the operating system **102**. After the system exits the OS, the system may still may be in a standby power mode **104**, in which the system can answer and process incoming calls, plus service other requests for other processing tasks. Users may have the option of turning off (or removing) all power to the unit **106**.

[0060] It should be further understood that, although a preferred embodiment of the invention has been illustrated and described herein. Changes and modifications can be made in the described arrangements without departing from the scope of the appended claims. Other embodiments, additions, and improvements will be obvious to those with an ordinary skill in the relevant art.

I claim:

15. A portable computer unit having two leaf structures that can be opened and closed like a book, portable computer unit comprising:

- a) a flat panel display assembly having a flat panel display device, control electronics and connection means which forms a first leaf structure;
- b) a microprocessor system electrically interfaced to said flat panel display assembly, having control circuitry, internal memory means and data storage means;